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09/957,395	09/19/2001	Anisul Khan	AM5782	4481

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07/29/2004

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EXAMINER

CULBERT, ROBERTS P

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 07/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/957,395

Applicant(s)

KHAN ET AL.

Examiner

Roberts Culbert

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 21-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Art Unit: 1763

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/21/04 has been entered.

Response to Arguments

Applicant's arguments with respect to the prior art rejections have been considered but are moot in view of the new ground(s) of rejection recited below.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 6-8 and 16-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not provide an embodiment as described in Claim 6. Claim 6 appears to be a combination of selected features of the embodiment described on (Page 6, Lines 1-14, and Figures 4a-4f) and the embodiment described on (Page 6, Line 15- Page 7, Line 11 and Figures 5a-5h). There is no description in the specification that would indicate to one of ordinary skill in the art that these various features may be combined as recited in Claim 6.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 1763

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 13, 14 and 16-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 13 and 16 are indefinite because it is not clear if the core material is deposited on the first insulating layer or on the bottom cladding layer or if the layers are the same layer.

Claim Objections

Claim 9 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 25, and Claim 4 is objected to as being a substantial duplicate of claim 21. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,307,242 to Sugiyama.

Sugiyama teaches a method of making an optical waveguide, comprising providing a substrate (Fig. 4a) comprising a semiconductor layer (12) disposed on a first insulating layer (10); forming an

Art Unit: 1763

opening through said semiconductor layer to said first insulating layer (Fig. 4b); depositing a core material (11) on said first insulating layer to fill said opening (Fig. 5a); removing excess core material (Fig. 5b); and depositing a top cladding layer (14) over the core material.

Regarding Claims 2 and 3, the semiconductor layer may be a silicon layer (Col. 5, Lines 55-57)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4, 13, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,307,242 to Sugiyama in view of U.S. Patent 6,553,170 to Zhong et al.

As applied above, Sugiyama teaches the method of the invention substantially as claimed, but does not teach that the first silicon oxide insulating layer (10) and the top silicon oxide cladding layer (14) each have a different refractive index. However, it is well understood in the waveguide fabrication art that the top and bottom cladding layers may have a different refractive index as long as both layers have a lower refractive index than the core layer. Zhong, for example, teaches a method of forming a waveguide having top and bottom cladding layers each with a different refractive index. The top clad (411) is

Art Unit: 1763

Boron doped, and the bottom clad (412) is SiO₂ (Col. 5, Lines 3-5). It would have been obvious to one of ordinary skill in the art at the time of invention to form the cladding layers of Sugiyama each with a different refractive index in order to improve the re-flow characteristics of the top clad layer and thereby improve the gap-filling properties of the top clad as taught by Zhong (Col. 2, Lines 55-61).

Note that the first silicon oxide insulating layer (10) of Sugiyama reads on a bottom cladding layer disposed in the opening as broadly recited in Claim 13.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,307,242 to Sugiyama in view of U.S. Patent 6,553,170 to Zhong et al. and in further view of U.S. Patent 3,934,061 to Keck et al.

As applied above, Sugiyama in view of Zhong teaches the method of the invention substantially as claimed but does not teach that the bottom cladding layer is formed of glass.

Sugiyama does teach that the bottom cladding layer is made from SiO₂, which may be glass. Nevertheless, Keck teaches that the use of glass for cladding layers is old and well known in the waveguide fabrication art. It would have been obvious to one of ordinary skill in the art at the time of invention to form the cladding layer using the conventional materials such as glasses.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,307,242 to Sugiyama in view of U.S. Patent 6,282,358 to Hornbeck et al.

As applied above, Sugiyama teaches the method of the invention substantially as claimed but does not teach that the excess core material is removed by chemical mechanical polishing. Sugiyama, however, does teach that the excess core material may be removed by polishing (Col. 6, Lines 13-16). It may be assumed that polishing in Sugiyama refers to chemical mechanical polishing as this technique is routinely used in the waveguide fabrication art. Hornbeck, for example teaches that CMP is used to remove excess core material after deposition in a trench. (Col. 7, Lines 48-61) It would have been obvious to one of ordinary skill in the art at the time of invention to use CMP to remove the excess core material in the conventional manner.

Claims 9-12, 15 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,307,242 to Sugiyama.

As applied above, Sugiyama teaches the method of the invention substantially as claimed but does not explicitly teach that the layer (9) is a second insulating layer. However, since Sugiyama teaches that the substrate is a SOI (Silicon on Insulator) substrate (Col. 5, Lines 54-56) it would have been obvious to one of ordinary skill in the art that layer (9) of Sugiyama is an insulating layer, since SOI substrates are conventionally formed from a silicon layer on one or more insulating layers which are typically formed from silicon oxide or silica glass. Official Notice is taken of the fact that SOI substrates are conventionally formed from silicon on insulating layers such as silicon oxide and glass as stated above and are routinely used in the waveguide fabrication art. It would have been obvious to one of ordinary skill in the art at the time of invention to form the silicon on insulator substrate in the conventional manner using a second insulating layer comprising silicon oxide or silica glass.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 09/957,395

Page 7

Art Unit: 1763

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